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PARK PLAZA URBAN RENEWAL PROJECT
BOSTON REDEVELOPMENT AUTHORITY

FINAL PROJECT REPORT
SUPPORTING DOCUMENTATION

Work Program

August 1973

4th Submission

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PARK PLAZA URBAN RENEWAL PROJECT

CEP
WORK PROGRAM



August 1, 1973

4th Submission



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I INTRODUCTION

The Work Program described herein identifies the agencies and participants, methodology, legal context, and details and chronology of such planning and design as will occur subsequent to the approval of the Project by the DCA as it will be integrated with the environmental, civic, and design review processes. Through it the Boston Redevelopment Authority will fulfill its responsibility and commitment to expose to close public scrutiny all environmental and community impacts as well as the planning and design process of the Park Plaza Urban Renewal Plan. Broadly defined, its purposes are:

PURPOSE

To comply with applicable environmental protection laws whether formally identified below, or subsequently found to bear upon sections of the project design and execution.

To provide a comprehensive framework for the planning and design of alternative programs which could be built and financed within the Park Plaza Urban Renewal Area; and to evaluate these alternatives on a timely basis.

To integrate systematically the evaluation of impacts of these alternatives in an iterative process in order that major, irreversible, adverse impacts can be avoided, eliminated, or minimized efficiently to a satisfactory level.

To develop criteria for evaluating impacts.

To establish duly constituted public participatory bodies as a forum for constructive criticism, where possible, on actions and policies affecting the public and related private interest.

To provide for a continuous process of public review of the environmental analysis, planning and design process for the Project, and of the design review process.

To require serious consideration of alternatives as a means of making the environmental impacts of the Project fully understood and intelligible to those responsible for planning and design decisions, and to the public.

IMPACT REPORTS

At the core of the Work Program is a series of staged, supplementary Environmental Impact Reports, carried on concurrently with appropriate parts of the planning and design process. The Environmental Impact Report, June 1973, prepared by the BRA and previously submitted to DCA to support the approval and determinations by the DCA with respect to the Park Plaza Urban Renewal Plan and Project, provides the starting point and initial document for such process. A final Report reflecting such study will be published by the BRA prior to commencement of land-taking procedures for the Project area. Applicable environmental protection laws will be followed.

The environmental studies will be carried out by the BRA staff and consultants qualified in their respective disciplines. The information will be made available to the developer(s) on a systematic basis for project design decisions. The environmental studies, planning and design will be continuously reviewed by the BRA Park Plaza Environmental Review Group set up within the BRA.

This group will be assisted by the Design Advisory Committee, an independent group of architects and landscape architects.

The above processes of design and review will be in turn reviewed by a Civic Advisory Committee, comprised of representative community, business, and civic groups. The makeup, rights, and responsibilities of these groups is described in greater detail below.

The scope of impacts and the criteria for evaluation will include the following categories:

- natural environment

- built environment*

- socio-political environment*

- economic environment

- *including all forms of municipal services and utilities

Information developed through the Work Program will include:

- formal organization and evaluation of existing data on the environmental (as broadly defined above) assets and limitations of the site and its environs

- new general and specialized data as required to identify and evaluate impacts

- new data developed in the planning and design process relating to mass use and location of structures and site work, including alternative solutions according to a prescribed format

- data from community, business, and civic groups from within or abutting the project area, through the Civic Advisory Committee

- more detailed standards and regulations as they may be developed by duly constituted environmental protection agencies having jurisdiction insofar as applicable

Through a detailed chronology the Work Program will marshal the required information for the EIR, direct staging of concurrent and sequential work tasks, and provide adequate time for the various reviews. Finally, through funding commitments, the Work Program will assure that sufficient information, expertise, and public participation is available to execute the project in the most beneficial and expeditious manner.

II METHODOLOGY

A. ENVIRONMENTAL REVIEW

LEGAL

The National Environmental Policy Act of 1969 (NEPA) represented a major shift in the traditional American perspective of the environment. Prior to the NEPA, the environment was generally considered to be subordinate to the actions and activities of man. In man's quest for "progress" the environment was more often perceived as an obstacle to be overcome - if not a threat. It is not necessary to review here the extensive environmental degradations that this perspective has fostered, or the extent of the widespread public concern that has followed. Proposed actions and activities must now demonstrate a compatible relationship with environmental quality goals.

A major element of NEPA was the establishment of requirements for the analysis of probable environmental impacts of proposed major development actions or activities using federal funds. Since its enactment, many states and local governments have followed this precedent in enacting legislation requiring the consideration and evaluation of the environmental impact. The Commonwealth of Massachusetts, in enactment of Chapter 30, Sections 61 and 62 of the General Laws, demonstrated its commitment to this new environmental ethic.

The National Environmental Policy Act calls for an evaluation of any proposed project by the Federal government to be made regarding the project's impact upon the environment and the country's resources. It calls for alternatives (to the "proposed action") to be evaluated, and describes a process by which this is to be done.

Section 62 of Chapter 30 of the Massachusetts General Laws requires that an Environmental Impact Report (EIR) contain a detailed statement describing, among other things, the alternatives to the proposed action and their environmental consequences.

Section 61 of Chapter 30 differs from Section 62 and from NEPA in that it requires an agency which is to make a "determination" regarding a project "shall include a finding describing the environmental impact, if any, of the project and a finding that all feasible measures have been taken to avoid or minimize said impact."

ADMINISTRATION

The Boston Redevelopment Authority has primary responsibility for administering the Work Program, of which the Environmental Review is the principal part. The BRA will engage competent consultants (Environmental Consultant) to administer the Review. The purposes of the review are:

to prepare environmental impact reports

to provide systematic, comprehensive, and accurate monitoring and evaluation of the environmental impacts of the Park Plaza Project during design and development

to clarify adverse consequences (including public costs) in time to take appropriate planning and design action to eliminate or minimize such impacts to meet acceptable standards

COORDINATION

The Environmental Review will be coordinated with the stages of the Project, described in detail under Section II D, below. At each successive stage plans will become increasingly more detailed, providing appropriate data for evaluation. The stages and scheduled times for completion are:

I	Building Study	4 months
II	Schematic Design	6 months
III	Design Development	5 months
IV	Working Drawings and Specifications	5 months

IMPACT REPORTS

At the completion of the Building Study Stage, the BRA will prepare a supplementary EIR coordinated with the review processes described herein. This Report will consider and complete the major review of alternatives concerning building mass, use and location. At the completion of the Schematic Design Stage, the BRA will prepare a second supplementary EIR which will contain full information on the impacts judged to be major, adverse, and irreversible as a result of planning and design decisions related to this and previous stages. The Reports will contain comments, reservations, qualifications, and questions generated through the review processes, together with formal written answers by the BRA and/or the Developer.

FINAL IMPACT

At the completion of the Design Development Stage the BRA will prepare and publish a final EIR based upon the Environmental Impact Report dated June 1973 and the supplementary environmental reports developed during the planning and design process. All Reports will be cumulative to show clearly the consideration of alternatives, identification of impacts, and measures taken to avoid or minimize damage to the environment.

The duties of the Environmental Consultant, described in detail below, will include the following:

ENVIRONMENTAL
CONSULTANT

- administration
- environmental inventory and base analysis
- development program interpretation
- correlation and standards
- monitoring and evaluation
- special studies
- report generation

DEVELOPER

The Developer, through the planning and design process, shall arrange consultant work schedules to coincide with the requirements of the Environmental Review and the several Work Tasks described in Section IV. All environmental data, together with social and economic data developed through the various review processes will be made available to the Developer and his consultants through the BRA.

Essential to the success of the Work Program is the establishment of an open process in which there is continuous feedback from both design and environmental decisions according to a schedule that will permit all pertinent data to be brought to bear on planning and design at the appropriate time. The Developer's budget for consultant services must reflect the demands which such a process will make upon professional services.

REVIEW
PROCEDURE

This section defines the broadscope methodology for the Environmental Review to be carried out under the Work Program by the Environmental Consultant. It establishes procedures to be used in the Work Tasks described in Section IV. It is interdisciplinary in that it unites the work of technical, scientific, economic, social, and design specialists. It is directed to:

- preparation of Environmental Impact Reports
- facilitating BRA, Civic, and Design Review
- providing data for the planning and design process
- systematic consideration of alternatives

The methodology is based on that developed by the BRA and its consultant (The Saratoga Associates). While all Work Tasks will not be administered by the Environmental Consultant, all data generated will be correlated and displayed through the routine and continuing process described herein.

Environmental Impact Reports will include:

SCOPE

a complete analysis of the environmental context of the Project

development of alternatives in keeping with the context

evaluation of these alternatives

a decision (or decisions) made by the BRA after consulting with the CAC

MATRIX

Potential impacts and issues will be defined to establish an information base and priorities with which to evaluate alternatives. Impacts will be defined as "potential" as distinguished from "probable" until such time as detailed data (both on the environmental base information and project design) indicate whether an impact will or will not occur. The matrix provided established the relationship between proposed actions which might affect the environment and conditions and character which describe that environment. The urban redevelopment process has been divided into 45 separate steps or activities beginning with land acquisition and culminating in occupancy and use of the Project; and with the demand/consumption activities associated with its use.

The description of the "environment" has been subdivided into four major categories, each of which has been further subdivided into separate characteristics or conditions. Initially there could be over 10,000 intersects (see Matrix, Appendix B). To date, these have been reduced to approximately 1300 potential impacts, of which some 340 have been judged to have high priority. (see "Final Project Report", Revised through June, 1973, included with BRA submittal to DCA). The Work Program will continue and enlarge upon this process as necessary to meet the objectives defined herein.

IMPACT SIGNIFICANCE

Potential impacts will be evaluated for significance as follows:

Duration of Impact
permanent
temporary

Nature of Impact
adverse
beneficial

Magnitude of Impact
major
minor

Scope of Impact
regional
local

These terms are further defined as follows:

"Duration of Impact" refers to the broad time frame during which the impact will occur. "Permanent" means that once the action or activity takes place, the impact will continue or will have a lasting effect on the environment. "Temporary" means that the impact will be restricted to a definable time frame (such as the construction period). Some temporary impacts may last for several years. Definition of the exact time span of temporary impacts will be made insofar as possible to predict.

"Nature of Impact" refers to the possible effect of the action or activity on the existing environment. "Adverse" means that the impact can (but not necessarily will) result in a degradation of existing environmental quality. "Beneficial" means that the action will always tend to improve environmental quality. This definition purposely "favors" the identification of adverse impacts under the assumption that it is in the Developer's interest to comprehend all of the direct and indirect costs of the Project (including so-called non-monetary costs related to the broadscope definition of "environment" detailed below) and can therefore direct the process of planning and design more efficiently and economically.

"Magnitude of Impact" refers to the degree to which the action or activity will change the existing environment. "Major" magnitude means that the impact will substantially and noticeably change the existing environment. "Minor" means that the change will be of relatively small magnitude. Where uncertainty exists regarding magnitude, it will be treated as major until more detailed information establishes it as otherwise.

"Scope of Impact" refers to the geographical area of the impact. "Local" means that the impact would affect only a small area (ie: the Project site or its immediate environs, or perhaps a specific off-site location). "Regional" means that the impact would affect a much broader area, either in conjunction with, or as distinct from, the site proper and immediate environs. Some regional impacts would be city-wide, others metropolitan, state, or interstate in scope.

IMPACT
PRIORITY

Potential impacts will also be evaluated for priority as follows:

Resource Commitment
Irreversible
Reversible

Planning Commitment
Pre-design
During design

Control jurisdiction
Outside agent
Project agent

Control Capacity
Future
Current

This matrix differs from the previously described analysis for issue significance and requires the following clarification:

"Resource Commitment" defines the most urgent impact issues. "Irreversible" means that the environmental impact, once it occurs, is not capable of being reversed, minimized, and/or avoided by existing available technology or program.

"Planning Commitment" defines the point at which decision-making generates an impact and therefore the point prior to which the potential impact should have full analysis and evaluation. "Pre-design" means that the environmental impact is implicit in the program for the project and no amount of design manipulation can affect the outcome. In order to avoid or minimize and undesirable impact it would be necessary to modify the program or adopt a scheduled alternative. "During design" means that the potential impact is related to the design of the project and can therefore be manipulated.

"Control Jurisdiction" defines the agent with responsibility for control of the impact. "Outside agent" means that an agency other than the Boston Redevelopment Authority (and by implication, the Developer) will be responsible for the technology or program necessary to control the impact.

"Control Capacity" defines the potential for technological or program control of the impact. "Future" means that the technology or program is not immediately available.

For example, the construction of certain forms of superstructure will affect the solar exposure of adjacent areas, particularly the Common and Public Garden. This impact has top priority for analysis because it is "irreversible" and must be considered in a "pre-design" stage. Since irreversible impacts are not subject to control, this impact would not be evaluated with respect to control jurisdiction or capacity.

As another example, occupancy and the use of the space will affect parking capacity. This impact is reversible, but it is a pre-design commitment implicit in the program. It is also controllable by an outside agent rather than the BRA, and the program capacity to control it currently exists.

CATEGORIES

The four major environmental categories (which have been subdivided into 250 sub-categories in the Matrix) include the following broad components:

Natural Environment

Site physiography

Bedrock geology

Surficial geomorphology and soils

Macro- and micro-climate

Air resources

Surficial hydrology

Sub-surface hydrology

Vegetative resources

Faunal resources

Perceptual quality, including sound, vibration, spatial design, and scenic character

Impacts in this category will generally require more definitive analysis of existing data and/or data which is readily synthesized.

Built Environment

Land use

Building and structural character

Circulation

Utilities

These impacts will require more graphic presentation of changes proposed in the structural form of the Project site and environs. New use relationships to existing utility and circulation systems require full correlation of program proposals with the capacities of existing systems (or with systems to be developed) on schedules related favorably with the Project schedule.

Socio-political Environment

Demographic structure

Institutional group structure

Neighborhood structure

Political structure

Impacts in these sub-categories have been introduced into the initial Matrix in accordance with urban development objectives and urban social structure. The Work Program will broaden the range to meet needs for identifying and evaluating impacts on established neighborhood structure and City services as advised in the "Interim Report on the Third Submission" prepared by the Park Plaza Civic Advisory Committee; q.v. (See Work Task 5)

Economic Environment

Public economy

Private economy

In addition to identification of positive values, the Work Program will carry out a comprehensive analysis of public costs and benefits (with particular emphasis on indirect costs required for development and maintenance of public facilities and services to serve the Project and impacted environs) of the alternatives.

REVIEW AREAS

The Environmental Review will be conducted in 7 general areas and coordinated with the 4 major stages of development. The areas are as follows:

- A Administration - continuous organization and evaluation of existing information on the environmental resources of the site; coordination with BRA staff, review committees, the Developer and his consultants; definition of special analysis needs; selection of sub-consultants; introduction of data developed by others into Review Matrix.
- B Environmental Base Inventory and Analysis - continue analysis of data assembled to date; specification, acquisition, and analysis of new data as required; identification of interface and interaction of environmental components (as listed above and in Matrix) to define second and third order impacts; refinement of data through successive stages of planning and design.
- C Development Program Interpretation - analysis of proposed development program and alternatives, and the proposed actions required to implement them; quantification where possible to delineate the specific duration, nature, extent, and magnitude of project impacts on the condition and characteristics of the Project environment; qualitative interpretation and evaluation where appropriate to the purposes of the Work Program.
- D Correlation and Standards - comparative evaluation of the detailed development program and alternates and the environmental base description; identification and description of areas of conflict in terms of specific impact characteristics; generation of possible

program alterations or design interventions; presentation of findings and recommendations to BRA and consultants, review committees, Developer and consultants; development of standards and criteria to guide project design; and translation of standards and criteria into specific recommendations for protecting, conserving, or utilization of the environmental resources of the Project setting.

- E Monitoring and Evaluation - at specified intervals for the formal resolution of environmental impacts at the close of each stage; at a system of checkpoints adapted from the general schedule provided in the Work Program and directed toward appropriate observation, monitoring, or evaluation during the planning and design process. Observational meetings will be short progress presentations by the design consultants during which the Environmental Consultant will analyze and evaluate design progress from the point of view of environmental impact. Monitor meetings will be presentations by the Environmental Consultant of emerging impact issues of concern to the design consultant. Evaluation meetings will be follow-up meetings to consider the feasibility and desirability of design solutions as regards environmental quality.
- F Special Studies - as required to supplement or refine existing and/or current data (of program as well as design); including primary research into the state of new technological developments which could assist in sustaining or attaining high levels of environmental quality, to achieve compensatory balance, or make working predictions of base environmental quality through sources of control outside of the Project for phasing with Project development schedules.
- G Report Generation - major component of Environmental Impact Reports, as scheduled in the Work Program; at intervals sufficient to effect the iterative process required by the review processes; and at least as scheduled herein. The Environmental Consultant shall be responsible for the form as well as the content of the Environmental Impact Reports.

DESIGN STAGES Phasing of the Environmental Review will answer the needs of the design process for an orderly and expeditious resolution of environmental conflicts. Significance and priority of impacts will establish the stage of design during which they must be resolved. The Environmental Impact Report, associated with the Building Study Stage, will serve to identify which (if any) adverse, major, irreversible, pre-design impacts will be allowed to pass through to subsequent stages of design. Acceptability may be achieved through elimination of certain alternatives and indicated solutions, modifications, or by satisfactory design interventions.

The Report, associated with the Schematic Design Stage, will serve to confirm compliance with the procedures

and principles set forth in the prior Report, further define acceptable alternatives, and indicate minor program and design modifications required to minimize, avoid, or eliminate adverse, major, design-controlled impacts.

The Environmental Impact Report, at the time of the Design Development Submittal, will serve to confirm compliance with approvals of previous stages and to indicate further refinements of program and/or design to control adverse impacts. All Reports will be prepared in accordance with applicable environmental protection laws and regulations.

While it is understood that a narrower construction of the scope of "environment" than that delineated herein may presently (or in some future administrative or court decision) be brought to bear on the Project through this Work Program, the above Environmental Reports will carry all data generated by the various review processes, including those set forth under Citizen and Design Review, below. Such information will serve further to document ways in which the project will meet the needs of the community as the design emerges and alternatives are evaluated.

B. DESIGN REVIEW

BRA
STAFF To evaluate the quality and appropriateness of architectural and landscape design on the basis of design objectives stated in the Urban Renewal Plan and on sensitivity to the full range of environmental considerations, the BRA will conduct an on-going review by its own staff and through the Design Advisory Committee described below. The review will be coordinated with the project stages listed in the section on Environmental Review, above, and described in greater detail below. Because the Building Study Stage will be conducted jointly with the Developer and his consultants, the design review process will commence with the beginning of this stage, especially as it relates to Perceptual Impacts described under Section V.

The review will be conducted under the supervision of the BRA Director of Design and its design review team. He will also coordinate the work of the Design Advisory Committee and assist the Civic Advisory Committee in its overview of the design review process. Scope and criteria for design review are set forth below.

DESIGN
ADVISORY
COMMITTEE

The Design Advisory Committee will be composed of prominent architects and landscape architects, acting independently to assist the BRA Review Group and the Civic Advisory Committee in its interpretation of the planning and design process; and to work with the Developer's consultants as a resource and critical reference. The recommendations of this Committee will be considered by the BRA prior to approval of proposed plans at each submittal it being understood that final determination will be made by the Authority.

The Committee shall evaluate sketch and formal submissions of the Developer, suggest design alternatives, and provide the BRA, the Developer, his architects, and the Civic Advisory Committee with objective advice directed to producing a project design worthy of the program and its locale.

SCHEDULE

The Committee shall meet as required, but at intervals not less than the following:

Building Study Stage	twice monthly
Schematic Design Stage	twice monthly
Design Development Stage	once monthly
Working Drawings and Specifications	as required

SCOPE

The scope of the design advisory process shall extend to the environmental review study wherever such data would have an impact on the project design. The Committee will be provided with all pertinent data when and as it is developed through the various review processes.

Specific details as to the schedule for staged approvals are set forth below. The Committee shall prepare a written report to be included with each submission, containing its evaluation, concerns, findings, and recommendations for the Project at that stage. This will become a part of the Environmental Impact Report as a substantive part of the Work Program section on Perceived Impacts.

DETAILED
OBJECTIVES

The Committee shall define in greater detail the planning and design objectives for the Project as they are required by development of the major design parameters and environmental constraints. It shall cooperate with the Civic Advisory Committee in its review responsibilities, and

may request data developed by that committee for use in design review. The Design Advisory Committee may make public statements concerning the project as it deems appropriate.

LIASON

The Civic Advisory Committee, in its overview of the project, will maintain a direct relationship with the Design Advisory Committee on relevant matters as described below.

CRITERIA

The criteria by which project actions will be evaluated will include the Plan Objectives as stated in the Urban Renewal Plan and pertinent data developed through the environmental impact study process. The objectives include:

Planning

- a. To provide a lively mixture of mutually reinforcing uses with emphasis on residential and daytime plus evening activity.
- b. To carefully integrate, as to scale and activity, the new development with the surrounding areas -- especially in the relationship of the buildings and uses along Boylston Street to the adjacent Boston Common and Public Garden.
- c. To provide multilevel attractive and continuous pedestrian areas through the Project with maximum separation between vehicular and pedestrian movements and convenient interfacing with other transportation modes (transit, taxi, auto, pedestrian).
- d. To eliminate excess and confusing roadways and replace them with an efficient, safe, and adequate new road system based on the overall proposed downtown traffic plan.

Design

- a. To create multi-use new structures, with the lower elements built close to the street lines so as to maintain the urban character.
- b. To provide a series of high-rise structures spaced apart as a continuation of the "high spine" of Boston.
- c. To build with materials whose color and scale relate well to the existing Boston architecture to Back Bay, Beacon Hill, and Bay Village.

- d. To create a new and pleasant environment within the public and semipublic areas to maximize the use of such areas and add a new dimension to the downtown commercial and entertainment areas.

Environmental issues which could have a direct bearing on the project design include, but are not limited to:

wind velocities within and adjacent to the project

shadow and solar exposure

load capacity of sub-strata

water table

temporary and permanent impacts on the Common and Public Garden

special consideration for park frontages

perceived impact of structures and spaces
(from within the project and from other locations in the City)

traffic volume and flow

air quality

pedestrian access

temporary protection for adjacent buildings, parks, public utilities, and other structures

Specific areas of concern at each stage will be:

AREAS OF CONCERN

1. Building Study

circulation - preliminary concepts related to connections and reinforcements with the City - pedestrian penetrations and connections in all directions

phasing - rational plan directed to feasibility of each phase proceeding independently or together with others

scale - and uses of low elements in relation to surrounding neighborhoods, open spaces, vistas, and specific buildings

open spaces - protection from winds, adverse weather; connections and uses

high-rise elements - number, location, uses, orientation; conclusive information on wind effects

energy consumption - as related to air quality control and proposed fuels

2. Schematic Drawings

circulation - main and subsidiary paths, connections to public transportation, vehicular circulation & volume, entry/exit points, internal connections

high-rise elements - connections at bases, floor-by-floor uses, refined analysis of wind effects

low elements - horizontal connections, uses, parking, rooftop appearance and uses

materials - preliminary consideration of surfaces and facing materials

3. Design Development

review - of approvals and concepts established in the Building Study and Schematic drawing stage for consistency and detail

circulation - complete circulation plan resolving all conflicts with City services, public transportation, streets, emergency access, relationships to adjacent neighborhoods

materials - complete schedule of all external cladding and servicing materials as they relate within the project and to the architectural character of the City

detailed planning - evolved in sufficient detail to ensure that there are no encroachments on height or building envelope and other environmental constraints established in previous stages

4. Working Drawings and Specifications

review - to ensure that approvals and concepts established in the Building Study, Schematic drawing and Design Development Stages are carried into the Contract Documents

C. CITIZEN REVIEW

The Civic Advisory Committee (a continuation of the Committee established on May 9, 1973) will review the Work Program in all aspects. Its members are drawn from a broad base of community, civic, and business groups. In addition to the review functions described

in the Work Program, it will assist in identifying and evaluating community impacts and responses to the planning and design. Its activities will be funded through the BRA in accordance with the schedule provided in Section VI.

Committee membership is by organization; in general from those representative groups which may affect or be affected by the Park Plaza Project. The following organizations are now represented:

Back Bay Association

Back Bay Federation for Community Development

Bay Village Neighborhood Association

Beacon Hill Civic Association

Boston Conservation Commission

Chinese Consolidated Benevolent Association of New England

Friends of the Public Garden

Greater Boston Chamber of Commerce

Greater Boston Real Estate Board

League of Women Voters

Neighborhood Association of the Back Bay

Retail Trade Board of Boston

RULES

Additional members may be added in accordance with the Committees by laws. Delegates to the Civic Advisory Committee must be the official delegates of the constituent organizations. Each organization may

appoint alternates. The Committee shall be free to organize its own rules and functions without interference from the BRA or outside agencies or individuals. Election of officers and appointment of sub-committees shall be in general open; minutes of all meetings, including executive sessions, shall be public record. Meetings will be held on a regular basis to facilitate ease in participation, with full and adequate notice to be given for special meetings, normally 7 days.

From time to time the Committee shall develop and refine its criteria for making decisions. The scope of such criteria shall embrace at least the following subjects:

economics of the City and region

community quality

city services

public transportation

air quality, noise, wind

distributional effects - economics

technology

acceptability/adaptability

administrative and legal

all design issues related to criteria in Work Program

and all issues to be evaluated in the EIR

PROCEDURE

The scope of the Civic Advisory Committee's activities shall include the monitoring of the environmental review and the design review process. While it is intended that such activities will be continuous, the Committee shall at the close of each stage file with each Environmental Impact Report a formal report of its findings, reservations, and questions directed to the BRA or the Developer. This report shall become a part of the Environmental Impact Report. The schedules for specific staged reviews by the Committee as well as the responsibilities of the BRA in the approval process are described below.

SPECIAL STUDIES

If the Committee finds that special studies are required to carry out its review responsibilities, it shall first apply to the BRA for funding and/or personnel for this specific purpose. If, for any reason, this request is not honored, the Committee shall have the authority to use funds from its budget for this purpose.

INFORMATION

The Committee shall have access to and be provided with all records of the BRA, including, but not limited to, reports, short and long range plans, maps, and other materials which the BRA has in its possession, except where the furnishing of such information would violate the right to privacy of individual citizens, or which the BRA must maintain in a confidential classification (normally appraisals and interoffice memoranda).

MEETINGS

The Committee or its delegates shall confer regularly with the Project Director. Such meetings shall be held at least twice monthly. The Committee may send delegates to any important planning or design conference held by the BRA on the Project. Determination of importance shall be by mutual agreement between the BRA and the Committee, but shall include all conferences at which issues relating to the scope of review set forth in the Work Program are to be discussed. The BRA will notify the Committee of all conferences and invite its presence, and provide all information and supporting documents related to the conference.

The Committee may request written replies of its inquiries from BRA, which shall be returned within a reasonable time, usually one week.

The Committee may make requests of and advise the Design Advisory Committee directly on an informal basis, or if formally, through the BRA. It may also furnish alternative planning and design ideas, and development proposals to the BRA from time to time.

The Committee shall advise its constituent agencies on the project and on any questions related to the impact of the project. It may make any part of its deliberations, concerns, and findings public.

The BRA shall invite and welcome the advice of the Committee generally, and assist it in consulting with environmental, technical, and economic consultants, and with the Developer and his consultants, it being understood, however, that final determinations will be made by the Authority. The BRA staff shall assist the Committee in obtaining direct access to the BRA Board and the Mayor whenever the Committee deems this to be necessary.

See Work Task 5 for additional description of CAC participation.

The BRA shall not appoint new developers nor shall it approve new consultants without first seeking the recommendations of the Committee. Prior to adopting a final development proposal for Parcels D and E, the BRA shall seek a thorough review by the Committee.

D. ADMINISTRATION

The BRA will coordinate and implement the Work Program according to the details of the schedule and chronology described herein. It will form a Park Plaza Environmental Review Group from members of its staff, consisting of the following individuals with specific lines of responsibility:

Deputy Director/Planning - coordination of environmental consultants, BRA planner assigned to the Project; transportation and research staffs, and review of subconsultants with the Project Director

Deputy Director/Development - analysis of project feasibility data and City and regional economic cost-benefit data

Director of Design - supervision of project architects and BRA design review team; coordination with the Design Review Committee; and technical assistance to the Civic Advisory Committee

Director of Engineering - supervision of planning and design of Project improvements

Project Director - coordination with project developers and Civic Advisory Committee; coordination of various studies for the environmental consultants; coordination of sub-consultants; overall Work Program administration

The Complex nature of the environmental and design review process will require substantial overlap of lines of administrative responsibility; each member of the BRA Review Group may work directly with members of either the Civic or the Design Advisory Committee.

SCHEDULING

The BRA Review Group will, in addition to other administrative duties, act as technical advisors to the Design and Civic Advisory Committees and assist them in making required reports and all studies incidental to their review functions. The following schedule describes the procedure by which each committee will be permitted time to evaluate staged submittals.

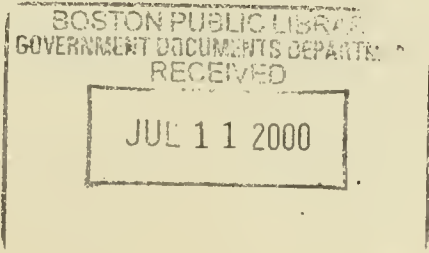
One month prior to each formal design submittal the BRA will require the Developer to make a working presentation showing work in nearly final form, together with relevant data, established criteria, alternatives considered, full analysis of impacts, and tentative conclusions; for the express benefit of the Design and Civic Advisory Committees. The Committees may make verbal observations for the benefit of the BRA and/or the Developer at the time of presentation, but shall in any event provide the BRA with written comments and questions within fifteen days of the presentation.

At the time of formal submittal the BRA will arrange for a presentation from the Developer and his consultants to the Committees (either together or separately). The BRA will present its answers to above comments and questions of the Committees verbally and in writing at the time of formal submittal.

Within fifteen days following formal submittal, the BRA will notify the Developer of approval, rejection, or the need for further clarification, and will so inform the respective Committees, together with a written report containing the reasons for the action plus answers to any questions filed by the Committees at the time of formal submittal.

E. SCHEDULE

Action	Required Time	Month
1. Approval		
2. City begins planning Charles St. improvements		
3. BRA prepared re-zoning application		
4. BRA completes appraisals of parcels in construction Stage A	2 months prior to submission of schematics	
5. Developer makes working presentation of Building Study	within 90 days of approval	3
6. Developer makes formal submittal of Building Study	within 120 days of approval	4
7. BRA reviews and approves or rejects Building Study	within 15 days of formal submission	4.5
8. Developer commences preparation of Schematic Drawings	if Building Study has been approved	
9. BRA and Developer prepare Master Land Disposition Agreement		
10. BRA and Developer execute Master Land Disposition Agreement	not later than 4 months after approval of Building Study	8.5
11. Developer makes working presentation of Schematic Design	within 5 months of Building Study approval and not later than one month after signing LDA	9.5
12. Developer makes formal submittal of Schematic Drawings	within one month of working presentation	10.5
13. BRA reviews and approves or rejects Schematic Drawings	within 15 days of formal submission	11
14. Developer makes working presentation of Design Development Plan for Stage A	within 4 months of schematic design approval	15



15. Developer makes formal submittal of Design Development Plan for Stage A	within one month of working presentation	16
16. BRA approves or rejects Design Plan for Stage A	within 15 days of formal submittal	16.5
17. Developer submits financing for land acquisition with a 30% contingency allowance relocation and demolition	within 6 months of approval of Schematic Design, Construction Stage A	17
18. BRA reviews and approves financing commitment for land acquisition in Stage A		
19. BRA commences land acquisition, relocation, and clearance	not sooner than 60 days after publishing EIR	
20. Developer submits working drawings for Construction Stage A	within 5 months of approval of design development drawings	21.5
21. BRA reviews and approved or rejects working drawings for Construction Stage A		
22. Developer submits construction financing	within 2 months of acquisition	
23. BRA reviews and approves construction financing		
24. Construction begins on Stage A	not later than four months after land is cleared	
25. Developer makes working presentation of Design Development Plan for Stage B		

III ALTERNATIVES

PURPOSE The alternative development configurations described below are consistent with the Park Plaza Urban Renewal Plan, and supportive of the goals of the Plan.

They have been suggested by the Civic Advisory Committee as phasing and dimensional alternates to be considered by the Work Program.

Certain of these alternatives, and certain elements from them, may be eliminated as the study progresses. Moreover, elements which would be environmentally beneficial and shared in common by several alternatives may be identified, approved, and put forward where possible for early implementation and construction.

SCHEDULE Reference is made throughout the Work Program to alternatives. Work tasks require that data be assembled, criteria developed, and evaluations made for conditions peculiar to, and consequences of definite program assumptions. At least these four (4) alternatives will be considered.

ALTERNATIVE I

The first alternative stresses the comprehensive development of the entire urban renewal area (Parcels A,B,C,D, & E), and the subsequent extension of this activity (as it appears reasonable and feasible) to adjacent areas.

It would include construction to the full height and density limits described in the Urban Renewal Plan, except as specific measures to avoid or minimize environmental harm are developed which may modify these limits. Alternative I envisions the phased redevelopment of all parcels. Of the scheduled alternatives, it most closely resembles the Developer's present proposal.

ALTERNATIVE II

The second alternative contemplates the separation of the renewal area into two distinct stages composed of presently delineated parcels as follows:

Stage I - Parcels A,B, & C

Stage II - Parcels D & E

This division coincides with that presently being presented for State approval. In addition, heights of all buildings would be limited to 125 feet along Boylston Street to a depth of 100 feet, for Parcels A,B, & C.

Alternative II specifically recognizes that the development of these two separate stages may be carried out by different developers and different investment teams. Each stage may require its own Environmental Impact Report. Although both projects are to be related to the same comprehensive plan for the City of Boston, neither project is to be dependent upon the other for its implementation.

ALTERNATIVE III

Alternative II would entail three separate stages divided as follows:

- Stage I - Parcel A
- Stage II - Parcel B & C
- Stage III - Parcel D & E

There would be a height limit on Parcel B construction not to exceed the present average height of existing buildings within this Parcel. Construction on Parcel A would be limited to 125 feet within 100 feet of the building line of Boylston Street.

This alternative is an extension of the logic of Alternative II, but recognizes the market dynamics peculiar to Parcel A in separating it for development. Construction would otherwise be permitted to the full heights and densities described in the Urban Renewal Plan for Parcels C, D & E, except as specific measures to avoid or minimize environmental harm are developed which may modify these limits.

Alternative III recognizes that the development of each of these three separate stages may be carried out by different developers and different investment teams. Like Alternative II, each stage may have its own Environmental Impact Report. Although each must be related to the same comprehensive plan for the City of Boston, none of these projects is to be dependent upon the others for implementation.

ALTERNATIVE IV

This alternative considers the consequences of deferring action, or taking no action to develop any of the Park Plaza Urban Renewal Area. It would instead emphasize rehabilitation of existing structures, new development on existing vacant

parcels, and selected acquisition and demolition of existing structures for new development. Height limitations would be as for Alternative III.

Any new development would require the preparation and filing of an Environmental Impact Report in accordance with applicable Federal and State requirements. The impact on the physical, social, and economic environment, existing and projected, of a program of rehabilitation and limited development will be identified and evaluated as a datum for comparison of the respective environmental analyses of Alternatives I through III.



IV WORK TASKS - INTRODUCTION

SCOPE Previous sections have described the goals, participants, and general methods of the Work Program. The following work tasks describe the purpose, responsibility, methods, schedule, and costs of the major activities related to environmental, design, and citizen review. The work task headings attest the interdisciplinary nature of an urban renewal work program. However, the Boston Redevelopment Authority will have the ultimate responsibility in determining the extent and applicability of these work tasks to the various stages of the environmental impact study.

1. Study Management
2. Public Cost and Tax Benefit
3. Project Feasibility
4. Family and Business Relocation
5. Community Quality
6. Retail Activity
7. Employment
8. Traffic, Transportation, and Accessibility
9. Ecology
10. Air Quality
11. Wind
12. Noise Control
13. Perceived Impacts
14. Parcels D & E

Except for Work Task 1, they all share a common structure. Each involves evaluation of base data (including verification and updating of information already on hand), interpretation of alternatives, development of criteria, and evaluation of Project impacts. Some also provide for subsequent monitoring of activities and phenomena consequent to design actions and/or construction completion.

METHODOLOGY The work tasks do not attempt to describe the entire range of development activity, nor do they circumscribe the scope of environmental, design, or citizen review. They do focus attention on manageable increments of activity dealing with the major concerns, and permit lines of responsibility and coordinated scheduling to be established. The detailed descriptions of the review processes will be used to effect the work tasks. For instance, the Environmental Review methodology will be applied to Work Task 9 (Ecology), etc.

Perhaps the most important function of the work task delineations is that of scheduling. In each instance the first order of business will be to establish which potential impacts are major, adverse, irreversible, and must be dealt with in the pre-design stage. In this way the Developer and the public, through the BRA and CAC, will minimize conflicting objectives and standards at the earliest possible stages of the project.

SCHEDULE See Appendix A

WORK TASK 1 - STUDY MANAGEMENT

PURPOSE The complex nature of the decision-making process inherent in the Work Program, together with a demanding time schedule, require an efficient, comprehensive format of leadership and control. The process, to accomplish its stated goals, must be participatory, decisive, based on equity, directed to short and long term goals, multi-valued, staged, and iterative. Each of these concepts is amplified under "Methodology", below.

RESPONSIBILITY Park Plaza Project Director, Environmental Consultant

METHODOLOGY The purposes, participants, and processes described in foregoing sections, plus the work tasks described herein, will be related through this Work Task. The following characteristics are essential to its effectiveness:

1. Participatory/Decisive

The environmental, civic, and design review mechanisms provide a structured format for broadening the range of insight and expertise in making sensitive and far-reaching environmental and social decisions. Management staff has the primary responsibility to see that all participants have full access to the information generated by the Work Tasks as well as existing base data. This will extend to preparation of progress reports; briefing sessions; graphic data (described under "sketch planning", below; technical assistance; and a continuous assessment of work activities. The primary goal is to arrive at sound, timely decisions.

2. Equity

The body of environmental law, plus other legal and administrative constraints (and incentives) to private development and public planning, can be most simply stated in terms of equity. More than a means of minimizing or avoiding harm, it must also be directed toward distinguishing between relative social "goods"; to achieving the maximum social benefit at the least (or most appropriate) social cost.

3. Short and Long Term Decisions

Serious consideration of reasonable alternatives is a primary ingredient of the concept of equity as it relates to political decision-making in the democratic process. Systematic evaluation of program and design alternatives will be used to achieve public understanding of complex planning and development processes and decisions.

4. Multi-valued Planning

This describes the employment of a wide range of political, economic, social, and environmental values in the same process with conventional development values, as initiated in BRA planning for the Submittal, and as carried forward through the Work Program.

5. Staged Decisions/Iterative Planning

In addition to the four scheduled stages for planning and design (Building Study, Schematic, Design Development, Working Drawings) it will be necessary to arrange for interim cycles to ensure that no single element of the study (and design) is brought to decision ahead of other elements and dominates all other considerations. This will involve a "sketch design" process to speed comprehension of the effect of criteria and constraints upon each other and upon design. It will further expedite elimination of unworkable alternatives at appropriate sub-stages, and allow completion of work tasks upon which early decisions can be reached. This will require continuous and intensive coordination by the study management team, especially during the early stages of the Project.

SCHEDULE See Section IV (Schedule), above, and Appendix A.

WORK TASK 2 - PUBLIC COSTS AND TAX REVENUE BENEFITS

PURPOSE The costs of public improvements (including streets, parks, transportation, and utilities) as well as fiscal expense of public services should have a favorable relation to the increase in tax return to the City reasonably attributable to the existence of the Project and to no other major cause.

RESPONSIBILITY Research Department, Boston Redevelopment Authority

METHODOLOGY The study, Boston Redevelopment Authority Research Department, Park Plaza; Public Costs and Tax Revenue Benefits to the City of Boston, July 1973, presents with respect to the planned development of Parcels A, B, & C of the Project an analysis of certain municipal costs, of municipal benefits deriving from the property taxation, and other alleged municipal benefits. It compares such costs and benefits on a basis of before and after, with and without Park Plaza. It contains:

- analyses and projections of the discounted present value of such costs and benefits

- analyses of the incremental stream of such costs and benefits over the construction and completion phases, 1974-84.

- measurement of such costs and benefits

- description of sources, methods, and concepts used in the analysis

This process and information, insofar as it is consistent with changed or additional relevant circumstances, with law, and accepted appraisal practice and except insofar as concerns such alleged benefits, will be used to evaluate alternatives at each stage of design and during development; as a guide in selecting design alternatives; as a guide to public policy in implementing the various phases and stages of the Project; and to project and monitor:

- progress in construction activity

- growth in residents, workers, enterprises, and their characteristics and related costs incurred by the City

- increases and decreases in market value and assessed

- value of other property attributable to the Project

- gross revenue, gross rental income of enterprises, and personal income of residents and workers

SCHEDULE Report at Building Study Phase, updated at Schematic Design and Design Development Stages, monitored thereafter.

WORK TASK 3 - PROJECT FEASIBILITY

PURPOSE The work program includes a financial evaluation of various alternatives to determine the land assembly cost that can be absorbed by the proposed density. It will also consider the relationship of the projected market to the estimated development costs to evaluate the assumption supporting the feasibility of the project and alternatives, if any.

RESPONSIBILITY BRA Deputy Director for Development; BRA Research Department;

This evaluation will include monitoring and review of such items as:

1. Land Assembly Costs

acquisition

relocation

demolition

2. Construction estimates for each element

hotel

garage

.. residential

retail

office

3. Relationship of the land assembly cost to total development cost; and the land cost absorbed by each unit of development

. hotel

garage

residential

retail

office

4. Market Analysis including

net rentable area

cross rents

operating expenses

net rent available for debt service

projected absorption rates

CRITERIA The economic feasibility of the project depends on the ability to obtain sufficient debt and equity financing. The environmental and design evaluation of various alternatives will be related to a financial analysis to determine the potential financing that would be available.

SCHEDULE Economic feasibility will be studied during the Building Study Stage (see master flow chart).

WORK TASK 4 - FAMILY AND BUSINESS RELOCATION

PURPOSE The needs of households and businesses relocated due to public acquisition for an urban renewal project must be adequately met. The study of impacts will include the indirect impacts on the housing, office, and commercial space markets together with the cumulative impacts on these markets due to other concurrent displacement.

RESPONSIBILITY Relocation Staff, Boston Redevelopment Authority.

METHODOLOGY The family and business relocation analysis will include four sub-tasks: acquisition of data; analysis of results; report preparation; and evaluation of the results of the study. Studies will be carried out in accordance with current professional and technical standards.

1. Acquisition of Data

The BRA has already filed a Relocation Plan for the Project with the Bureau of Relocation of the Department of Community Affairs.

Information regarding residential and commercial site occupants for Stage I has been acquired through site occupant surveys by trained relocation staff.

Information on residential occupants includes:

- number and type of households in each disposition parcel

- ages, occupations, and income for the household

- present rent and size of unit

- preferences as to relocation

- size and rent of replacement housing

The survey of commercial occupants includes:

- amount and type of floor space (e.g., ground floor)

- detailed information on special problems (such as relocating a liquor license or institution)

- locational and space preferences for replacement space

Information on relocation resources such as the number of vacant housing units in downtown, the condition of these units, and their size and rent level; as well as the amount and location of suitable commercial space will be considered. Current information will be obtained

from census data, newspaper listings, realtor's listings, the Ryan-Elliott Real Estate Market Survey, BRA data on new construction, the Greater Boston Real Estate Board, the Building Owners and Managers Association, Boston's Economic Development and Industrial Commission, and relocation staff research.

2. Analysis of Data

Tabulation of data for each alternative will include an estimate of non-residential displacement; a list of the housing requirements of displaced families, individuals and joint households; an estimate of concurrent displacement; and an estimate of relocation costs. The adequacy of the housing and commercial resources to meet the needs of displaced site occupants will be measured.

3. Report Preparation

The results of ongoing data acquisition and analysis will be set forth in a report. It will summarize the information concerning relocation in Stage I (Parcels A, B, and C).

4. Evaluation of Reports

Family and business relocation reports will be reviewed by the Environmental Consultant and the Civic Advisory Committee. In addition, when a developer is selected and acquisition is contemplated for Stage II (Parcels D & E), further relocation information will be prepared and submitted to the City Council and the State.

CRITERIA Standards for relocation of the Department of Housing and Development rules and regulations will be followed. The "Minimum Standards of Fitness for Human Habitation" of Article II of the State Sanitary Code will be used in evaluating replacement housing. In addition, housing units for referral will meet with BRA relocation policies on active opposition to housing discrimination, on convenient location for replacement units, and on family or individual ability to pay housing costs; and will be in accordance with the household's cost, location, and other preferences. The resources to meet the need for replacement housing will be considered adequate if they meet with the above standards.

The criteria for evaluating indirect and cumulative effects on the housing, office, and commercial space markets will be based on the proportion of each market to be changed due to the urban renewal project and the present condition of each market (e.g., vacancy rate).

SCHEDULE Analysis of Data - Building Study Stage
Report Preparation - Building Study Stage
Evaluation of Reports - Building Study review period

WORK TASK 5 - COMMUNITY QUALITY

PURPOSE This Work Task fulfills a dual role: in addition to the basic routines described in the introduction to this Section, it provides an opportunity for the Civic Advisory Committee (CAC) to take a more direct role in relating the Project to its constituent communities and groups. The Review Process will have fulfilled its obligation to communicate with CAC constituent groups (but not to non-affiliated groups, agencies, or individuals) through this Work Task.

At issue will be the impacts generally described by the list of work tasks, but focused directly at community scale. They will include temporary as well as permanent impacts; from development activity (including project scheduling) through to completion of construction.

RESPONSIBILITY Project Director and staff; Civic Advisory Committee and staff.

METHODOLOGY The Work Task will adopt the methods of the several disciplines (work tasks) as well as the procedures describing Citizen Review in Section II, above. The CAC will assist in identifying priority impacts and community-related secondary impacts. These will be scheduled into the various reviews and design process at community assigned values. Every effort will be made to interpret the review and design process to the community in clear and non-technical language, using graphics where ever appropriate.

The Work Task will be supportive of community cohesion by:

- ensuring two-way communication during design

- providing technical assistance to impacted communities through BRA staff and CAC activities

- reinforcing public policy (such as zoning) wherever it can be instrumental in allowing business and/or residential communities to preserve or improve their character in response to Project related activities and pressures

- directing attention of other public agencies (police, fire, traffic and parking, public works, parks and recreation, relocation and business assistance) to project-related pressures and conditions

The BRA, with the assistance of the CAC, will compile for purposes of evaluating project impacts the following data:

existing population profiles for Project area and affected neighborhoods

proposed and/or projected profiles for Project area and affected neighborhoods

formally stated neighborhood and civic policies, objectives, and long-range planning programs

perceived impacts and neighborhood criteria

present and proposed recreational planning for the Project area and for affected neighborhoods (including both public and private planning for active and passive recreation)

WORK TASK 6 - RETAIL ACTIVITY

PURPOSE Development of Park Plaza will have multiple effects on the retail activity in the Central Business District, Beacon Hill, and the Back Bay as well as the immediate Park Square area. A survey will assess the nature and extent of these effects, ways to avoid or minimize effects which are adverse, and as a guide to formation of public policy with regard to the retail strength of the downtown districts.

RESPONSIBILITY Research Department, Boston Redevelopment Authority

METHODOLOGY In addition to conducting a survey of the shoppers now patronizing Park Square shops to determine the market area, the following activities will provide an information base to guide planning and design decisions:

1. Existing Retail Activity in the Park Square Area

inventory existing retail activities in Project area (Parcels A, B, & C)

based on square feet ratios, estimate sales volumes for these establishments

estimate both direct and indirect sales volume generated by the establishments, workers, and residents within the Park Square and from the surrounding areas

compare retail activities in the Park Square area now with City's retail activities

2. Retail Activity During the Development Phase

estimate the number of retail establishments displaced at various stages of the development for each scheduled alternative

compare estimated retail sales lost during the Redevelopment to the sales gained at different development stages

estimate indirect impact during the development stage on retail sales in the surrounding areas (CBD, Beacon Hill, and Back Bay)

compare retail sales lost with sales gained over entire development period

3. Retail Activity in Park Plaza after Completion of Stage I

characterize retail establishments in Park Plaza Stage I development and scheduled alternatives by type, sq. ft., and market area

estimate retail sales volume generated by the retail establishments in Park Plaza and what share of the downtown retail sales market would be represented by Park Plaza - particularly, what share of the projected growth in downtown retail sales would be represented by Park Plaza retail activities

estimate retail sales generated directly by the residents, workers, and visitors in Park Plaza

estimate the indirect impact of the retail activities, residents, workers, and visitors in Park Plaza to the surrounding area (CBD, Beacon Hill, and Back Bay)

analyze the market for Park Plaza retail establishments

- a. determine where Park Plaza shoppers would be (are) coming from
- b. define (if possible) the competitive market areas for the Park Plaza retail establishments

4. Summary and Conclusion - the direct and indirect impact of Park Plaza development alternatives on the retail sales in the Park Square area and in the surrounding CBD, Beacon Hill, and Back Bay retail areas.

SCHEDULE Study report for review during Building Study Stage; updated final report prior to acquisition/demolition stage of development; monitoring and re-analysis during and after completion of Stage I development.

WORK TASK 7 - EMPLOYMENT

PURPOSE Development of Park Plaza will have a marked impact on temporary and permanent employment in the Project area. A survey is required to assess the nature and extent of effects of alternatives as a guide to planning and design; and to furnish other employment-directed activities with useful data, and thereby assist individuals whose employment has been adversely affected by the Project.

RESPONSIBILITY Research Department, Boston Redevelopment Authority, with special consultants, if required.

METHODOLOGY The Work Task will be accomplished in three parts: impact on employment in Project environs; impact on City's labor force; and summary and conclusions of findings.

1. Impact on Employment in Park Square Development Area

a. Present employment situation

estimate employment by industry for firms located on Parcels A, B, & C, and for firms in the surrounding areas (CBD, Beacon Hill, and Back Bay)

estimate occupational composition of the employment in the development area and determine average wages earned by workers

b. Employment during the development period

estimate employment by industry during the acquisition, demolition, and construction phases of scheduled Project alternatives for Parcels A, B, & C and for surrounding areas

(1) Employment estimates would reflect the phasing of the development (i.e., when the building was actually demolished and when it would become occupied, etc.).

(2) Determine the number of jobs that would be displaced as a result of scheduled Project development alternatives. Classify by industry and occupation.

(3) Estimate, for use in assessing impact on City's and Metropolitan labor force, employment data related to "no-build" Project alternatives (or reduced program) arising from projects (if any) that would proceed in absence of Park Plaza competition.

estimate occupational composition and average wages earned by the remaining and new workers during Project alternate development stages

c. Employment after completion of Stage I

estimate employment by industry for the firms and establishments occupying the Park Plaza facilities on Parcels developed in Stage I upon completion

estimate employment generated by Project Stage I in the surrounding areas and in the City as a whole

estimate the occupational composition and average wages earned by workers in Project Stage I after completion (1983)

2. Impact on City's Labor Force

Using the employment and occupational data generated in Part 1, above, estimate the number of job opportunities that are presently available to Boston residents in the Park Square area and compare this with the number of job opportunities that would be available during the development phase and after completion of alternatives selected for Stage I.

- a. Try to determine to what extent the displaced workers could find employment in other sections of the City or Project, or how many of the displaced workers would take advantage of the manpower training programs in the City.

Compare the occupational and employment profile of the present residents of the Park Square area with the projected occupational and employment profiles of the new residents of Park Plaza.

- a. Estimate the number of additional City jobs that would be held by the new Park Plaza residents.
- b. Determine the average earned income for the old residents and new resident workers.

3. Summary and Conclusions of Findings of Impact of Park Plaza on Employment

Prepare data developed in Parts 1 and 2, above for Environmental Impact Report.

SCHEDULE Draft report of above data for review during Building Study Stage; update final report prior to acquisition and demolition; monitoring and re-analysis after completion of Stage I.

WORK TASK 8 - TRAFFIC, TRANSPORTATION AND ACCESSIBILITY

PURPOSE It will be necessary to determine the impact of Park Plaza Development upon the traffic and public transit conditions in the downtown area. Since a part of the planning includes substantial street improvements and a reduction in "surplus" street surface, the problems of measurement and projection are complex. They will deal with such goals as:

determination of vehicular traffic flow for each alternative to assist in determining noise levels and pollutant sources for Work Tasks 10 and 12

design of traffic patterns to carry Project-generated and through traffic as effectively as possible, with minimum disruption to the Project area and its environs

measures to encourage the highest possible proportion of new travellers to use public transit

design of improvements within and adjacent to the Project (to streets, pedestrian ways, and public transit installations) which will benefit Project occupants and provide increased convenience to its abutters

RESPONSIBILITY Transportation Planning Department, Boston Redevelopment Authority; with assistance from the City Traffic and Parking Department and the Massachusetts Bay Transportation Authority.

METHODOLOGY The Submittal contains an evaluation and conclusions of City-sponsored planning and Project-related traffic together with numerous references to traffic studies made in and about the area over the past few years. The Work Task will update this data and reorganize it to show varying conditions (based on alternatives) in four general areas: vehicular (passenger and truck); public transit (rail and bus); pedestrian; and measures to influence selection of alternate forms of transportation (modal split).

1. Vehicular

From a schedule of number of occupants for different kinds of uses for each alternative, daily trip loads will be projected. This will include both peak and off-peak periods, as well as varying assumptions about modal split and car occupancy levels. Auto trips will be assigned to the various streets by two methods:

by ratio of current traffic distribution

by judgemental distribution relating to the intended future role of the various streets (as displayed by alternate designs)

Other data, dependent upon public policy, will establish projected curb and off-street parking spaces which will influence traffic volume; as well as regional policies which may affect overall core city traffic loads.

2. Public Transit

Impacts on rail and bus transit can be evaluated in terms of station congestion, waiting times, and more elusive factors related to funding of public transportation. Studies will deal with changes in demand on public transit; experimental mini-bus programs; scheduled improvements in MBTA rail transit system; and proposed bus route changes.

3. Pedestrian

The Submittal in dealing with projected pedestrian flows (see Final Project Report, pages 56 et seq.) describes a sophisticated line of analysis dealing with prototypical hotel and shopping movement. It considered the concept of a moving sidewalk and the "extensive, covered, and climate controlled pedestrian walkway----connecting Back Bay and the downtown." Work Task will be directed to evaluation of such criteria as covered interconnection with garages, public transit, and buildings and activities within and near the Project. Measurements of speed, convenience, climate control, and access will be evaluated as an end in itself as well as a means to an end.

4. Measures to Influence Alternate Modes

Growing concern for air pollution as well as vehicular congestion and energy consumption has set in motion a series of sweeping proposals to minimize these adverse impacts. They include use of staggered work hours, car pools, escalated parking fees, metropolitan area "entry" controls, and belatedly, state and federal highway funds for urban transit.

The development period for Park Plaza is sufficiently protracted to embrace one or more of these measures. As data becomes available, it will be used to bring planning and design criteria in line with reliable projections. At the same time, data developed through Work Task 10 (Air Quality) may control density or phasing of the Project to keep within Federal air quality standards.

TEMPORARY IMPACTS Traffic during construction is treated under Work Task 5 (Community Quality) which also deals with temporary impacts (community disruption). The Transportation Work Task will provide data on volume and alternate routes for construction-related traffic to assist in minimizing such community impacts.

SCHEDULE Projected traffic volume for alternatives will be required during the Building Study Stage, as will long range modal predictions. Specific traffic patterns and pedestrian movement are a function of the design process and will be the subject of a continuing work study appraisal.

WORK TASK 9 - ECOLOGY

PURPOSE The several scientific and/or technical disciplines through which we may comprehend and control or cope with natural phenomena are varied but share a common methodology. This Work Task attempts to group those with the most obvious affinities, while separating others (*) with extremely high priorities (and therefore well past the threshold of public awareness) into individual work tasks. It provides a means of interpreting to the lay person the complex values and judgements required to protect the ecological resources of the Project area while providing a systematic data base for planning and design decisions. The subjects are:

Site Physiography

Bedrock Geology

Surficial Geomorphology

Climate*

Air Resources*

Surficial Hydrology

Subsurface Hydrology

Vegetative Resources

Faunal Resources

Perceptual Quality

Sound*

Vibration*

Spatial Design*

Scenic Character*

RESPONSIBILITY Environmental Consultant, with assistance of special BRA consultants; CAC and consultants (see Work Task 5).

Review data developed to date by BRA and Saratoga Associates; amend and augment as required; establish priorities; assess skills available to complete data base and make evaluations, and recommend additional consultants (if required); develop standards and criteria; evaluate impacts of alternatives; prepare working reports at scheduled points; monitor design process; prepare formal reports.

WORK TASK
SUBDIVISIONS

The following component disciplines require varying extent and character of attention. Several have already been well documented in the Submittal, needing only updating and inclusion of alternative considerations. The outlines are for general guidance and are not intended to replace the more formal process of individual impact identification and evaluation established in the Environmental Review methodology. For instance, no assignment is made of major-minor, permanent-temporary, reversible-irreversible, adverse-beneficial, priority, etc. This is a part of the Work Task.

1. Site Physiography (land form)

Primary Concern: impact on community and disposal areas of removal of materials and debris from demolition; excavation and site preparation; and construction debris

Control: by project agent (Developer and contractor) in response to existing laws and regulations

Pre-design Requirement: methods affect economic feasibility

2. Bedrock Geology

Primary Concern: valid foundation system capable of supporting structures and not damaging neighboring streets, utilities, transit facilities, and buildings; during construction and after completion

Control: project agent (Developer and consultants) through engineering research and design, supervision of construction, and site monitoring by independent engineering survey; Submittal contains description of information base, techniques, and consultants used to date

3. Surficial Geomorphology

Primary Concern: changes in the texture and permeability of soils in the Common and Public Garden due to increased use through higher population density of the Project

Control: public, through establishment (by zoning and/or the renewal process) of appropriate project density; through public policy leading to design and construction of passive and active recreation areas within the Project to absorb new demands; and through satisfactory maintenance of soil and other conditions within the Common and Public Garden; Submittal contains information on maintenance program and recommendation for complete soil tests, maps, and profiles as they relate to faunal and vegetative resources

4. Climate

Primary Concern: effect on people and vegetation of reduced solar exposure (shadows), and reflection or glare from new vertical building surfaces; impact of changes in wind speed and direction on fauna (including people) and vegetation; Note: Wind is treated separately in Work Task 11.

Control: by project agent (Developer and consultants) through design; Submittal contains draft criteria for and evaluation of shadow impact; Work Task will include re-evaluation of Submittal data, addition of new base data and criteria with assistance through Work Task 5 (Community Quality), including more detailed analysis of community use patterns of adjacent open spaces, preparation of certified expert findings on initial and cumulative effect of shadows on vegetation, and development of guidelines and funding for required maintenance programs

5. Air Resources

Primary Concern: impact of pollutants from Project (or Project caused) activity and installations from start of demolition through construction and occupancy; treated as separate Work Task 10

6. Surficial Hydrology

Primary Concern: disposition of rainfall and run-off water from Project site as it affects existing or planned utilities

Control: public, through Public Works Department planning, construction, and maintenance policies; Submittal contains strategic and quantitative analysis of present and projected conditions and measures; Work Task will verify data and evaluations in context with Project alternatives; affects determination of public costs

7. Sub-surface Hydrology (water table)

Primary Concern: impact of excavations, foundation work, and construction on ground water levels, and therefore on structures (including utilities and transit installations) in immediate vicinity as well as older buildings in the Back Bay

Control: by project agent (Developer and consultants) through engineering analysis and design, and construction technology; Submittal contains basic data and proposed method for avoiding harm; monitoring will be by independent engineering survey

8. Vegetative Resources

Primary Concern: cumulative effect of reduced solar exposure, changes in wind direction and force, air quality reduction, soil compaction, and changes in water table on established plant life in Project area and environs (especially the Common and Public Garden); Note: shadows are treated in No. 4. (Climate) above, while air quality and wind are the subjects of separate work tasks

Control: varies with cause, see pertinent work tasks; Submittal contains inventory of plant life in Common and Public Garden, description of recent landscape study and report leading to a master plan for these areas, and data on natural factors important to plant health; Work Task will continue analysis through verification of base data, expanded expert appraisal, and rigorous consideration of program and design alternatives that will avoid or minimize need for extraordinary measures

9. Faunal Resources

Primary Concern: effect of high-rise buildings on bird migratory flight patterns; "unauthorized" architectural habitats for indigenous nuisance avian species and rodents; impact of demolition and construction debris on faunal life in disposal areas; community impact of augmented domestic pet population

Control: by project agent (Developer and consultants) through building design, control of construction practice, and planned facilities for Project pets; public, through enactment and/or enforcement of pet control laws; Work Task will add consultation with ornithological and zoological experts, community evaluation and advice

10. Perceptual Quality

Primary Concern: while included under "Natural Environment," perception of spatial design and scenic character are a discipline in themselves, closely related to the impacts of the built environment and the process of

Design Review; they are treated under Work Task 13 (Perceived Impacts), while sound (and vibration) are treated under Work Task 12 (Noise Control)

SCHEDULE Building Study Stage for major, irreversible, adverse impacts; others when appropriate to design schedule.

WORK TASK 10 - AIR QUALITY

PURPOSE An objective, quantitative process is needed to relate the extent, density, and phasing of Project program and planning to possible improvements in air quality brought about through other legal, administrative, and technical means.

RESPONSIBILITY Environmental Consultant; special traffic and air quality consultants as required.

METHODOLOGY The Federal Clean Air Act calls for a reduction of approximately 65 percent in hydrocarbons and 40 percent in carbon monoxide by 1975 or at least by 1977. It is possible to predict traffic volume from design data (uses, density of Project) and from administrative measures such as higher parking fees or reduction in commuter traffic through incentives or regulation. More difficult to predict is the relationship of improved, expanded public transportation to further reductions in traffic volume and therefore air pollutants.

A second parameter, that of pollutants contributed through fuel consumption for Project heating and cooling or processing activities, is susceptible to control through program and design. But overall magnitudes must be known, together with measures to avoid or minimize adverse effects, in the earliest stages of design in order to resolve program questions of Project density.

The Work Task will use standard techniques of analysis, projection, and measurement to supplement data already included in the Submittal.

SCHEDULE Building Study Stage

WORK TASK 11 - WIND

PURPOSE Basic understanding of environmental wind effects as they relate to tall buildings is far from complete, as is knowledge of techniques available to minimize adverse impacts. This Work Task will use every method available to assess wind forces that would be caused by scheduled Project alternatives in order to resolve all such problems in the earliest stage of design.

RESPONSIBILITY Environmental Consultant and special BRA consultant; Developer and consultants.

Preliminary assessment of prevailing conditions contained in the Submittal will be augmented by a "design vocabulary". This will be a compilation of all known wind effects by a qualified consultant for use by the Developer and his architects in arriving at preliminary building forms for scheduled Project alternatives.

Wind tunnel tests, insofar as they are applicable, will be made of each alternative and subsequent modifications until acceptable predicted wind force levels are met. Results will be presented in a systematic tabulation of all alternatives, with expected percentage variation in accuracy due to limitations of testing process, and certified by the wind study consultant.

Standards and criteria will be developed from available data (and as a part of Work Task 5), and conformed with ecological requirements of Work Task 10. The wind study will be directed to:

- establish location and extent of wind problem areas within the Project and in all abutting districts and open spaces

- duration and seasonal variations in problem wind speeds

- correlate existing technology with building design and open space planning

SCHEDULE Building Study Stage

WORK TASK 12 - NOISE

PURPOSE Public monitoring and control of high energy sounds and vibration is predictably well within the period over which much of Park Plaza will be developed. Its planning and design will anticipate, insofar as practicable, the advent of comprehensive measures to reduce urban, and especially transportation-related, sound levels.

RESPONSIBILITY Environmental Consultant and special BRA consultant (if required).

METHODOLOGY Techniques and standards for monitoring and establishing acceptable sound levels have been in existence for some time. The majority of sounds (except for construction noise and vibration) related to the Project will come from vehicular transportation. Since one of the purposes of the Project is to improve present traffic patterns and flow, and to relocate an interurban bus station, present levels can be expected to drop. New traffic related to the Project will be projected, along with expected increases in sound levels. Points of access will be controlled during planning and design to avoid impacting sensitive areas within and around the project. Research will be devoted to selection of building and paving surfaces that are capable of modulating and/or absorbing sound energy.

Temporary noise generation due to construction activity (including vehicular access for personnel and materials) will be controlled through administrative measures designed to minimize inconvenience to Project abutters, including intown residential neighborhoods. Schedules and other arrangements will be made with the advice of the CAC, which will serve to channel complaints from constituent organizations.

SCHEDULE Building Study Stage

WORK PROGRAM 13 - PERCEIVED IMPACTS

PURPOSE The scenic character of the Project area and environs is based upon a visual imprint of experience shared in varying degrees by those who live in, work in, or pass through it. A sufficient body of research and understanding exists to objectify impacts of major visual phenomena as well as architectural and landscape detail upon the observer.

While individual reactions or the designer's rationale may appear to be subjective, they are united in a perceptual process that searches for meaning, orientation, and reassurance from the visual environment. The social and economic success of Park Plaza, as well as the continued liveability of its neighboring districts, will depend in large measure on the ways in which this meaning is made manifest through its built forms and related spaces.

RESPONSIBILITY BRA design review, Design Advisory Committee, Civic Advisory Committee, Developer and consultants.

METHODOLOGY The scope of design review and guidelines contained in the Submittal provide a sound basis for evaluation of program and design alternatives. This Work Task will supplement them with experiential criteria derived from the community through the CAC and from related professions through the DAC. It will serve as a guide to the Project Architects in relating architectural forms and spaces to a gentle, subtly varied city fabric. In turn, the Work Task will provide a vehicle for the Developer and his Architect to interpret specific design objectives, requirements, and solutions to the public. At issue (in addition to previously stated objectives and criteria) will be:

the way in which Bostonians see their own parts of the City in relation to the Project area

interpretation of successful and unsuccessful attempts to relate high-rise structures to the City

ways in which structures of appropriate size can be made to relate to the Common and Public Garden, while others relate to the Shawmut Peninsula as defined by water forms and other topographic detail

uses of symmetry and natural order to determine orientation and "direction" of structures

evaluation of "kinetic" relationships of built forms and open spaces as perceived at pedestrian and vehicular movement scale

ways in which buildings and plazas can enhance, rather than exploit the visual character of the Project environs

SCHEDULE Building Study Stage for major structures; and as required by Project design schedule

WORK TASK 14 - PARCELS D AND E

PURPOSE The Interim Report on the Third Submittal prepared by the Civic Advisory Committee proposes further study for Parcels D & E as a guide to development of Stage II. This Work Task will be directed to a joint BRA-CAC evaluation of the economic, physical, and social conditions of these parcels as they relate to the Downtown Entertainment District. The Report cites the following subjects for study:

Objectives related to the overall goal of an improved entertainment district.

Desired uses consonant with this goal, and tied to innovative zoning restrictions for adult uses.

Evaluation of floor area ratios reflecting appropriate uses and market conditions.

A consolidated program of rehabilitation and/or new construction.

Provision for selection of suitable developers on an appropriate schedule.

Plans for early action in Parcels D and E to stabilize the area and permit existing operators to improve facilities and services.

RESPONSIBILITY BRA Project Director and staff

METHODOLOGY The BRA staff, with the assistance of the Design and Civic Advisory Committees, will carry out a study to create a development program for these parcels. It will include:

1. Planning Studies

- a. Entertainment District - A planning analysis of the existing entertainment district which focuses on Parcels D and E, but encompasses a larger area north on Washington Street, east to Chinatown, and into the South Cove Project Area. Determine specific physical planning and economic solutions for retention and upgrading a Central Entertainment District for the City.
- b. Retail Core - Continuing planning in the retail area with special emphasis on the future development of the Raymond's area.

- c. Chinatown - Development of a policy for public and private action in the Chinatown district which will support further strengthening of this combined commercial/residential area.
- d. South Cove - Updating of information concerning the South Cove with special attention given to the New England Center Area and preservation of the Wilbur Theater and the Music Hall.
- e. Traffic and Parking - Refine the circulation and parking plans in the abutting areas in the light of developing Downtown parking policy and the redefined development plans.
- f. Transit and Pedestrian - Create a more specific pedestrian movement plan and refine potential transit improvement to the Boylston and Essex Stations. Link CBD to Park Plaza with mini-bus via Parcels D and E.

2. Economic Studies

- a. Marketing - Tighten up on market potential through cross-analysis of Park Plaza studies, Larry Smith Hinge Block Report, and BRA Research Staff reports on retailing, office, and housing markets.
- b. Public Funds - Explore all possible sources of Federal, State, and local funding which may be available to this project (in view of its several special characteristics).

3. Rehabilitation Analysis

- a. Physical Potential - Review each structure for feasibility of rehabilitation.
- b. Economic Potential - Review costs of rehabilitation and relationship of structure to remaining development parcels for new construction.

4. Environmental Impact Report

- a. Follow appropriate steps in Work Program to prepare joint or individual EIR based upon refined plan for Parcels D and E.

5. Developer's Kit

- a. Prepare offering of Parcels D and E to include all available data on existing conditions, planning and design objectives, review procedures, financial plan, and procedures for disposition of parcels.

PURPOSE The citizen review process, by its very nature, is one of advocacy. In this instance the role is dual: in addition to monitoring official concern for environmental quality, the Civic Advisory Committee will be actively concerned that the Project, through its refinements and changes, will continue to meet the needs of the community.

Inasmuch as its members are delegates of a range of civic, community, and commercial groups (who may also have been selected for their objectivity and concern for the larger interests of the City), the CAC will be autonomous. The size, complexity, and schedule of the Project will place heavy demands upon those public citizens who choose to volunteer their time and skills. In order to make the best possible use of each member's efforts, the CAC will require a competent staff with a budget adequate to accomplish its purposes.

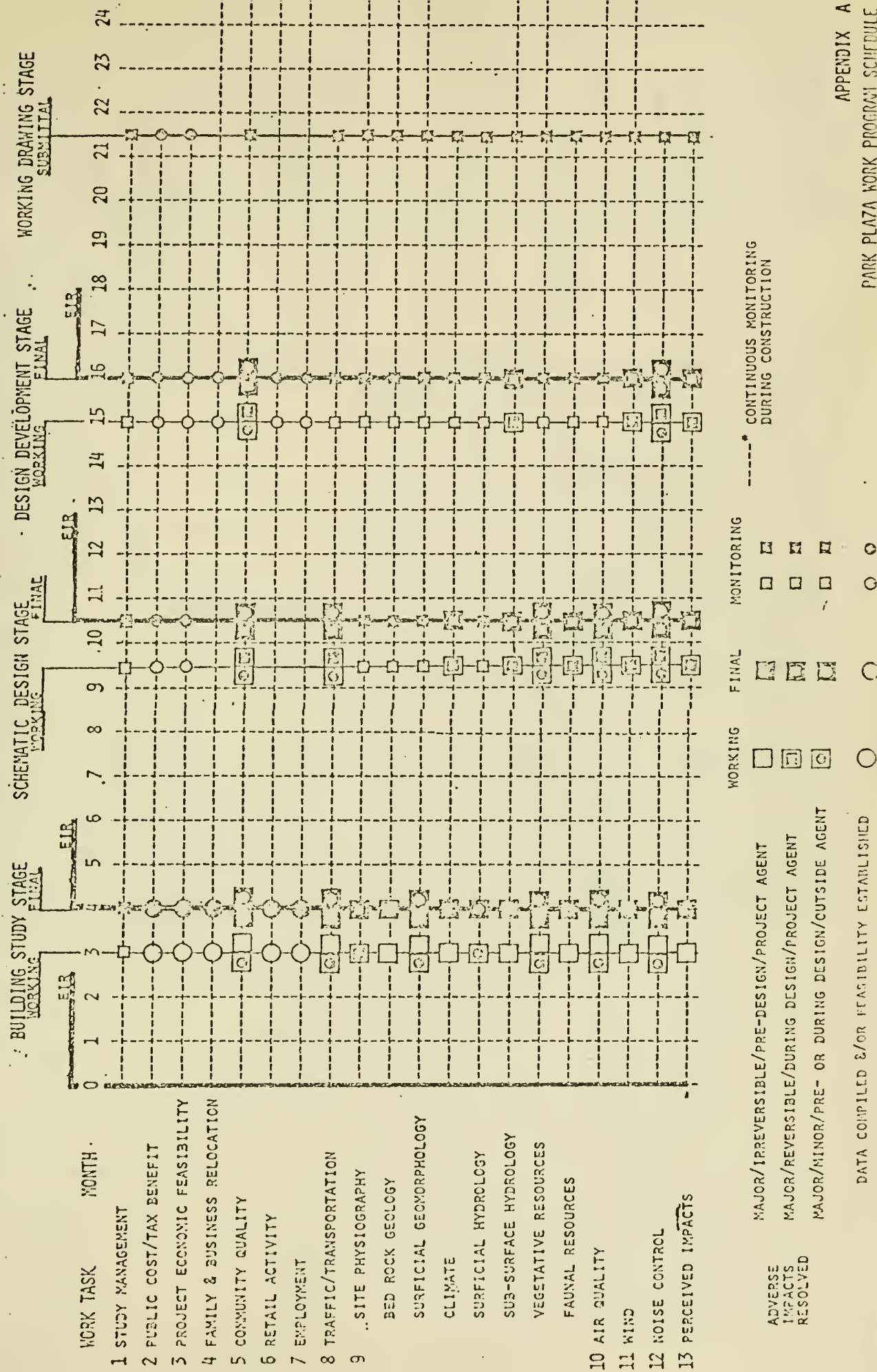
In the belief that sound information and imaginative leadership are the best tools with which to resolve public differences, the CAC will also have funds for independent research, planning, or evaluation, as described elsewhere in the Work Program.

The CAC will require the services of an executive director who must be experienced in community work as well as the planning and design disciplines. He will attend all meetings (as described under Citizen Review, above) and represent the Committee when required to do so. He will interpret all activities observed to the Committee through a formal reporting process. He will also be responsible for the public information aspects of Committee policy and findings. When special consultants are required, the executive director will assist in selecting them, and act as liaison for the Committee. It is anticipated that for the first year, the director's services will be continuous, although not necessarily full-time.

The Committee's activities will require a secretary, office space, meeting space, and a budget for telephone, printing, mailing, and, if the Committee so desires, a community newsletter. While this space can be shared and/or supplied by the BRA, every effort will be made to ensure an atmosphere of functional independence in order to preserve public credibility.

The BRA is prepared to fund the CAC activities in the amount of twenty-five thousand dollars (\$25,000.00) per year. The total budget for CAC, excluding costs of special consultants, is estimated to cost approximately forty thousand dollars per year. The BRA will assist the CAC in obtaining additional funding from public and/or private sources.

BRA will, for the duration of the project, fund CAC in an amount not less than that provided for in the first year.





PROPOSED ACTIONS AFFECTING THE ENVIRONMENT

CONDITIONS & CHARACTERISTICS OF THE ENVIRONMENT

LAND ACQUISITION
RELOCATION OF PEOPLE
RELOCATION OF BUSINESS
RE-ROUTING OF CIRCULATION
RE-ROUTING OF UTILITIES

EMPLOYMENT CONST. LABOR FORCE
TRANSPORTATION - CONST. LABOR FORCE
CONST. LABOR FORCE - PARKING
CONST. LABOR FORCE - FOOD SVC.
CONST. LABOR FORCE - SANITATION
CONST. LAB. FORCE - WATER - POWER
CONST. PHASE CRIME HAZARD
CONST. PHASE FIRE HAZARD
CONST. PHASE SAFETY HAZARD
HEAVY EQUIP. TRANSPORT.
Hvy EQUIP. STORAGE - FUEL/GEN.

DEMOLITION - EXIST. STRUCTURE
REMOVAL - DEMOLITION DEBRIS
DISPOSAL - DEMOLITION DEBRIS

PURCHASE - CONST. MATERIAL
TRANSPORT - CONST. MATERIAL
STORAGE - CONST. MATERIALS

EXCAVATION/SITE PREP.
REMOVAL OF SOIL FROM SITE
DISPOSAL OF SPOIL

CONST. OF SUBSTRUCTURE
CONST. OF SUPERSTRUCTURE
CONST. OF SITE IMPROVEMENT
REMOVAL OF CONST. DEBRIS
DISPOSAL OF CONST. DEBRIS

PURCHASE OF EQUIPMENT
TRANSP. & INSTALL EQUIP.

EMPLOYMENT OF WORK FORCE
OCCUPANCY & USE OF SPACE

POWER DEMAND/CONSUMPTION
FUEL DEMAND/CONSUMPTION
WATER DEMAND/CONSUMPTION

TELEPHONE SERVICE DEMAND
PUBLIC SIGNAL SVC. DEMAND
SANITARY SEWER GENERATION
WATER DEMAND GENERATION
SOLID WASTE GENERATION

PEOPLE MOVEMENT DEMAND
VEHICLE MOVEMENT DEMAND
GOVT. SERVICES DEMAND

LAND FORM

TOPOGRAPHY

SLOPE

BEDROCK GEOLOGY

BEDROCK TYPE

BEDROCK DEPTH

BEDROCK COVERAGE

BEDROCK THICKNESS

BEDROCK STRENGTH

SEISMIC STABILITY

FAULTS & FRACTURES

OUTCROP LOCATIONS

DEEP AQUIFIC LOCATIONS

UNIQUE EXPOS./POSSIBLE

SURFICIAL GEOLOGY

GEOMORPHIC TYPE

SOIL SERIES

SOIL PROFILE

SOIL COMPOSITION

SOIL DEPTH

SOIL TEXTURE

SOIL PERMEABILITY

SOIL BEARING CAPACITY

SOIL ACIDITY

AIR RESOURCES

PARTICULATE LEVEL

PARTICULATE TYPE

ODORS

CLIMATE

AIR TEMPERATURE

PRECIPITATION

HUMIDITY

SNOW ACCUMULATION

WIND DIRECTION

WIND SPEED

SOLAR ORIENTATION

SOLAR EXPOSURE

EVAPORATION/TRANSPIRATION

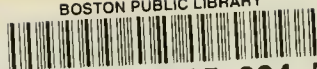
SURFICIAL HYDROLOGY

MATRIX

SAMPLE

Appendix B

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